CLAIMS

1. Endoscopic apparatus having a distal end for insertion into a body of a patient and a proximal end that is held outside the body of the patient, the apparatus comprising:

a proximal cylinder, disposed in a vicinity of the proximal end of the endoscopic apparatus;

a proximal piston, slidably contained within the proximal cylinder;

a distal cylinder, disposed in a vicinity of the distal end of the endoscopic apparatus;

a distal piston, slidably contained within the distal cylinder;

a tube for containing a liquid, coupled between the proximal and distal cylinders; and

a tool coupled to be actuated by displacement of the distal piston, so as to perform a mechanical action on tissue of the body or contents of the body, responsive to displacement of the distal piston.

2. Apparatus according to claim 1, wherein the tool, the distal cylinder, the distal piston and the tube are adapted to be passed through a working channel of an endoscope so as to access a region within the body using the endoscope.

3. Apparatus according to claim 1, wherein the tool is adapted to access a portion of a gastrointestinal tract of the patient.

4. Apparatus according to claim 1, wherein the tool comprises a biopsy tool.

5. Apparatus according to claim 1, wherein the tool comprises a therapeutic tool.

6. Apparatus according to claim 1,

wherein the distal cylinder has two regions, on respective sides of the distal cylinder,

wherein the tube is adapted to be in communication with a first one of the regions,

wherein a second one of the regions is configured such that motion of the distal piston in a first direction changes a fluid pressure in the second region, and

wherein the distal piston is coupled to the distal cylinder so as to experience a force in a second direction, opposite to the first direction, responsive to the change in fluid pressure.

7. Apparatus according to any one of claims 1-6, wherein the proximal piston is adapted to be hand operated.

8. Apparatus according to claim 7, wherein the apparatus comprises a linkage, coupled to the proximal piston, which is adapted to facilitate hand operation of the proximal piston.

9. Apparatus according to any one of claims 1-6, wherein the tool is coupled to the distal piston so as to be actuated by pressurization of the tube by the liquid due to operation of the proximal piston.

10. Apparatus according to claim 9, wherein the tool comprises a forceps, and wherein actuating the tool by pressurization of the tube causes the forceps to close.

11. Apparatus according to claim 9, wherein the tool comprises a snare, and wherein actuating the tool by pressurization of the tube causes the snare to close.

12. Endoscopic apparatus having a distal end for insertion into a body of a patient and a proximal end that is held outside the body of the patient, the apparatus comprising:

a distal piston;

a distal cylinder within which the distal piston is slidably contained, and which is in a vicinity of the distal end of the endoscopic apparatus, the distal cylinder having a first distal port proximal to the distal piston and a second distal port distal to the distal piston;

a tool coupled to be actuated by displacement of the distal piston;

a proximal piston;

a proximal cylinder within which the proximal piston is slidably contained, and which is in a vicinity of the proximal end of the endoscopic apparatus, the proximal cylinder having a first proximal port proximal to the proximal piston and a second proximal port distal to the proximal piston; and

first and second tubes, the first tube coupling one of the proximal ports to one of the distal ports, and the second tube coupling the other one of the proximal ports to the other one of the distal ports, such that:

(a) proximal motion of the proximal piston drives liquid through one of the tubes to apply a positive pressure to a first side of the distal piston to displace the distal piston in a first direction and actuate the tool to be in a first state, and

(b) distal motion of the proximal piston drives liquid through the other one of the tubes to apply a positive pressure to a second side of the distal piston to displace the distal piston in a second direction and actuate the tool to be in a second state.

13. Apparatus according to claim 12, wherein the tool, the distal cylinder, the distal piston and the tube are adapted to be passed through a working channel of an endoscope so as to access a region within the body using the endoscope.

14. Apparatus according to claim 12, wherein the tool is adapted to access a portion of a gastrointestinal tract of the patient.

15. Apparatus according to claim 12, wherein the tool comprises a biopsy tool.

16. Apparatus according to claim 12, wherein the tool comprises a therapeutic tool.

17. Apparatus according to any one of claims 12-16, wherein the proximal piston is adapted to be hand operated.

18. Apparatus according to claim 17, wherein the apparatus comprises a linkage, coupled to the proximal piston, which is adapted to facilitate hand operation of the proximal piston.

19. Endoscopic apparatus having a distal end for insertion into a body of a patient and a proximal end that is held outside the body of the patient, the apparatus comprising:

first and second proximal cylinders, disposed in a vicinity of the proximal end of the endoscopic apparatus;

first and second proximal pistons, slidably contained within the respective proximal cylinders;

at least one distal cylinder, disposed in a vicinity of the distal end of the endoscopic apparatus;

at least one distal piston, slidably contained within the at least one distal cylinder;

a first tube for containing a liquid, coupled between the first proximal cylinder and the at least one distal cylinder;

a second tube for containing a liquid, coupled between the second proximal cylinder and the at least one distal cylinder;

a mechanical linkage, coupled to the first and second proximal pistons so as to: (a) move the first proximal piston and cause positive pressure in the first tube when the mechanical linkage is displaced in a first direction, and (b) move the second proximal piston and cause positive pressure in the second tube when the mechanical linkage is displaced in a second direction; and

a tool coupled to be actuated by displacement of the at least one distal piston, so as to perform a mechanical action on tissue of the body or contents of the body, responsive to displacement of the distal piston.